

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Koichiro Tanaka
Serial No. : 09/842,797
Filed : April 27, 2001
Title : METHOD OF FABRICATING SEMICONDUCTOR DEVICE

Art Unit : 2822
Examiner : Maria F. Guerrero

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT IN REPLY TO NOTICE OF NON-COMPLIANCE

In response to the Notice of Non-compliance, applicant submits the attached Brief On Appeal. Applicant notes that there is only one ground of rejection such that sub-headings in the argument section are not required.

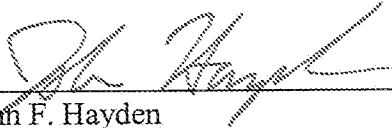
Applicant submits that the attached documents meet the requirements under 37 CFR 41.37 and it is respectfully submitted that the Brief on Appeal be considered.

No fee is believed to be due in connection with the filing of this paper on the Electronic Filing System (EFS). In the event that any fees are due, please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: _____

3/28/06



John F. Hayden
Reg. No. 37,640

Customer No. 26171
Fish & Richardson P.C.
1425 K Street, N.W. - 11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331
/adt
40335308.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Koichiro Tanaka	Art Unit	: 2822
Serial No.	: 09/842,797	Examiner	: Maria F. Guerrero
Filed	: April 27, 2001	Confirmation No.:	7383
Title	: METHOD OF FABRICATING SEMICONDUCTOR DEVICE		

Mail Stop Appeal Brief - Patents

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

(1) **Real Party in Interest**

Semiconductor Energy Laboratory Co., Ltd., the assignee of this application, is the real party in interest.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of Claims

Claims 1-52 are pending in the application, with claims 1-6, 31, 33, 34 and 36 being independent. Claims 31-52 have been withdrawn from consideration.

(4) Status of Amendments

The claims have not been amended subsequent to the final rejection dated June 10, 2005. A Notice of Appeal was filed on October 7, 2005. A listing of the current claims is attached.

(5) **Summary of Claimed Subject Matter**

The claimed subject matter is directed to fabricating a semiconductor device. In one aspect, as recited in claim 1, an amorphous semiconductor film having an upper surface is formed. See, for example, page 18, lines 20-24. A first crystalline region then is formed by irradiating a laser beam to a first region of the upper surface of the amorphous semiconductor film by relatively moving the laser beam in a first direction with respect to the first region of the amorphous semiconductor film. See for example, page 23, line 24 to page 24, line 4, and page

24, line 22 to page 25, line 4. After forming the first crystalline region, a second crystalline region is formed by irradiating the laser beam to a second region of the upper surface of the amorphous semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in a direction parallel to the first direction with respect to the second region of the amorphous semiconductor film, such that the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction. See, for example, Figs. 4A and 27A; page 8, line 21 to page 9, line 20; and page 10, line 22 to page 11, line 21. In general, a wavelength of the laser beam falls in a range of 370 nm through 650 nm. See, for example, page 11, lines 1-2.

In other aspects, the laser beam has a linear or a rectangular shape (claims 2, 3, 5 and 6) (see, for example, page 11, lines 9-11) and is moved in a short direction of the beam shape (claims 3 and 6) (see, for example, Figs. 4A-4C); prior to the laser irradiation, a first crystalline semiconductor film is formed by a heat treatment (claims 4-6) (see, for example, page 21, lines 11-16).

(6) Grounds of Rejection

Claims 1-18 and 25-30 have been rejected as being unpatentable over Yamazaki '080 (U.S. Patent No. 5,365,080) in view of Andra and admitted prior art. Claims 19-24 have been rejected as being unpatentable over Yamazaki '080 in view of Andra, the admitted prior art, and Yamazaki '730 (U.S. Patent No. 5,893,730).

(7) Argument

With respect to claim 1 and its dependent claims, appellant requests reversal of this rejection because neither Yamazaki '080, Andra, the admitted prior art, nor any proper combination of the three describes or suggests forming two crystalline regions using the same laser beam. Instead, Yamazaki '080, which the Examiner has cited for describing the formation of the two crystalline regions, describes forming a first crystalline region by irradiating with a first laser beam and forming a second crystalline region by irradiating with a second laser beam having a longer wavelength than the first laser beam. (See Yamazaki '080 at col. 2, lines 20-35.) Thus, since Yamazaki '080 notes that the second laser beam has a different wavelength, the

second laser beam necessarily cannot be the same laser beam as the first laser beam. Moreover, neither Andra nor the admitted prior art would have provided motivation to modify the system of Yamazaki '080 to use the same laser beam for both regions. Accordingly, for at least these reasons, appellant requests reversal of the rejection of claim 1 and its dependent claims.

In the "Response to Arguments" portion of the final action, the Examiner attempts to address this issue by stating: (1) "the rejected claims do not require the laser beam should have the same wavelength because the claims recited 'a wavelength of the laser beam falls in the range of 370 through 650 nm'" and (2) that "Yamazaki shows forming two crystalline regions using the same laser beam with different pulse durations (Fig. 4(B)-4E, col. 4, lines 65-68, col. 5, lines 1-5, col. 6, lines 1-10)." As to the first point, appellant notes that the recitation of the range of wavelengths that the laser beam may have in no way changes the fact that the claim recites that both crystalline regions are formed using the same laser beam, and in no way indicates that the laser beam may have different wavelengths at different times. As to the second point, appellant disagrees with the Examiner's conclusion. In particular, the passage of Yamazaki at col. 4, line 65 to col. 5, line 5, describes an example in which an excimer laser is used to crystallize a first region and a YAG laser is used to crystallize a second region. Similarly, the passage at col. 6, lines 1-10 describes a different example in which a continuous-wave argon ion laser beam is used to crystallize a region of a device in which a KrF excimer laser was previously used to crystallize a different region (see Yamazaki '080 at col. 5, lines 27-34). Accordingly, appellant continues to believe that the rejection should be reversed for the reasons noted.

In addition, and as also was noted in the prior response, appellant requests reversal of the rejection of claim 1 and its dependent claims because neither Yamazaki '080, Andra, the admitted prior art, nor any proper combination of the three describes or suggests forming partially overlapping regions such as are recited in claim 1 on the upper surface of the semiconductor film. Yamazaki '080, which describes using two laser annealing steps, with the first step crystallizing a relatively shallow region 5 to 100 nm deep from the surface, and the second step crystallizing a relatively deep portion 50 to 1000 nm deep (see col. 4, line 51 to col. 5, line 6), is silent as to the overlap of different regions in a direction in which a laser beam moves. While the admitted prior art shows overlapping regions in Figs. 4A and 27C, the overlap is along the entirety of the first direction. Thus, in the admitted prior art, the first region overlaps

with all of the second region along the first region, rather than only a portion of the second region along the first direction.

The "Response to Arguments" included at the end of the rejection addresses this argument by focusing on the "only a portion" language of the claim while ignoring the "along the first direction" language. Appellant does not necessarily disagree with the definition of "overlap" set forth in the rejection. Rather, what appellant disagrees with is that the "along the first direction" language of claim 1 is ignored by the rejection.

As set forth in claim 1, "the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction." Thus, along the edge of the second region extending in the first direction, the second region would extend beyond one or both ends of the first region. Such an arrangement is not described or suggested by Yamazaki, Andra, the admitted prior art, or any combination of the three. Instead, the admitted prior, for example, shows overlapping regions that overlap along the entirety of the first direction.

Independent claims 2-6 similarly recite using the same laser beam to form first and second crystalline regions, and that the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction. Accordingly, appellant requests reversal of the rejection of claims 2-6 and their dependent claims for the reasons discussed above with respect to claim 1.

Claims 19-24 have been rejected as being unpatentable over Yamazaki '080 in view of Andra, admitted prior art and Yamazaki '730. Appellant requests reversal of this rejection because Yamazaki '730 does not remedy the failure of the other references to describe or suggest the subject matter of the independent claims from which claims 19-24 depend.

Accordingly, for at least these reasons, appellant requests reversal of the pending rejections.

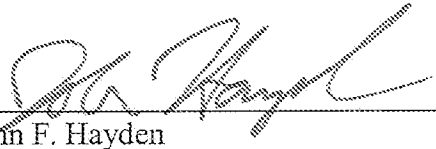
Applicant : Koichiro Tanaka
Serial No. : 09/842,797
Filed : April 27, 2001
Page : 5 of 22

Attorney's Docket No.: 12732-034001 / US4891

No fees are believed to be due. Please apply any other charges or credits to Deposit
Account No. 06-1050.

Respectfully submitted,

Date: 3/28/06



John F. Hayden
Reg. No. 37,640

Customer No. 26171
Fish & Richardson P.C.
1425 K Street, N.W., 11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

40335335.doc

Appendix of Claims

Claim 1 (Previously Presented): A method of fabricating a semiconductor device comprising the steps of:

forming an amorphous semiconductor film having an upper surface;

forming a first crystalline region by irradiating a laser beam to a first region of the upper surface of the amorphous semiconductor film by relatively moving the laser beam in a first direction with respect to the first region of the amorphous semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating the laser beam to a second region of the upper surface of the amorphous semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in a direction parallel to the first direction with respect to the second region of the amorphous semiconductor film;

wherein:

a wavelength of the laser beam falls in a range of 370 nm through 650 nm,

the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction.

Claim 2 (Previously Presented): A method of fabricating a semiconductor device comprising the steps of:

forming an amorphous semiconductor film having an upper surface;

forming a first crystalline region by irradiating a laser beam having a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape to a first region of the upper surface of the amorphous semiconductor film by relatively moving the laser beam in a first direction with respect to the first region of the upper surface of the amorphous semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating the laser beam to a second region of the upper surface of the amorphous semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in a direction parallel to the first direction with respect to the second region of the upper surface of the amorphous semiconductor film;

wherein:

a wavelength of the laser beam falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction.

Claim 3 (Previously Presented): A method of fabricating a semiconductor device comprising the steps of:

forming an amorphous semiconductor film having an upper surface;

forming a first crystalline region by irradiating a laser beam having a shape at an irradiated face or a vicinity thereof in a linear or rectangular shape to a first region of the upper surface of the amorphous semiconductor film by relatively moving the laser beam in a short direction of the laser beam with respect to the first region of the upper surface of the amorphous semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating the laser beam to a second region of the upper surface of the amorphous semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in the short direction of the laser beam with respect to the second region of the upper surface of the amorphous semiconductor film;

wherein:

a wavelength of the laser beam falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the short direction of the laser beam.

Claim 4 (Previously Presented): A method of fabricating a semiconductor device comprising:

a first step of forming an amorphous semiconductor film having an upper surface;

a second step of forming a first crystalline semiconductor film by partially crystallizing the upper surface of the amorphous semiconductor film by a heating treatment; and

a third step of forming a second crystalline semiconductor film by irradiating a laser beam to the crystalline semiconductor film;

wherein the third step comprises the steps of:

forming a first crystalline region by irradiating the laser beam to a first region of the first crystalline semiconductor film by relatively moving the laser beam in a first direction with respect to the first region of the first crystalline semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating the laser beam to a second region of the first crystalline semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in a direction parallel to the first direction with respect to the second region of the first crystalline semiconductor film; and

wherein:

a wavelength of the laser beam falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction.

Claim 5 (Previously Presented): A method of fabricating a semiconductor device comprising:

a first step of forming an amorphous semiconductor film having an upper surface;
a second step of forming a first crystalline semiconductor film by partially crystallizing the upper surface of the amorphous semiconductor film by a heating treatment; and
a third step of forming a second crystalline semiconductor film by irradiating a laser beam having a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape to the first crystalline semiconductor film;

wherein the third step comprises the steps of:

forming a first crystalline region by irradiating the laser beam to a first region of the first crystalline semiconductor film by relatively moving the laser beam in a first direction with respect to the first region of the first crystalline semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating the laser beam to a second region of the first crystalline semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in a direction parallel

to the first direction with respect to the second region of the first crystalline semiconductor film;
and

wherein:

a wavelength of the laser beam falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction.

Claim 6 (Previously Presented): A method of fabricating a semiconductor device comprising:

a first step of forming an amorphous semiconductor film having an upper surface;
a second step of forming a first crystalline semiconductor film by partially crystallizing the upper surface of the amorphous semiconductor film by a heating treatment; and
a third step of forming a second crystalline semiconductor film by irradiating a laser beam having a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape to the first crystalline semiconductor film while relatively moving the laser beam in a short direction of the laser beam with respect to the first crystalline semiconductor film;

wherein the third step comprises the steps of:

forming a first crystalline region by irradiating the laser beam to a first region of the first crystalline semiconductor film by relatively moving the laser beam in the short direction of the laser beam with respect to the first region of the first crystalline semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating the laser beam to a second region of the first crystalline semiconductor film including a portion of the first crystalline region by relatively moving the laser beam in the short direction of the laser beam with respect to the second region of the first crystalline semiconductor film;
and

wherein:

a wavelength of the laser beam falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the short direction of the laser beam.

Claim 7 (Original): The method of fabricating a semiconductor device according to claim 1, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 8 (Original): The method of fabricating a semiconductor device according to claim 2, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 9 (Original): The method of fabricating a semiconductor device according to claim 3, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 10 (Original): The method of fabricating a semiconductor device according to claim 4, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 11 (Original): The method of fabricating a semiconductor device according to claim 5, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 12 (Original): The method of fabricating a semiconductor device according to claim 6, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 13 (Previously Presented): The method of fabricating a semiconductor device according to claim 1, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 14 (Previously Presented): The method of fabricating a semiconductor device according to claim 2, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 15 (Previously Presented): The method of fabricating a semiconductor device according to claim 3, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 16 (Previously Presented): The method of fabricating a semiconductor device according to claim 4, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 17 (Previously Presented): The method of fabricating a semiconductor device according to claim 5, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 18 (Previously Presented): The method of fabricating a semiconductor device according to claim 6, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 19 (Previously Presented): The method of fabricating a semiconductor device according to claim 1, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 20 (Previously Presented): The method of fabricating a semiconductor device according to claim 2, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 21 (Previously Presented): The method of fabricating a semiconductor device according to claim 3, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 22 (Previously Presented): The method of fabricating a semiconductor device according to claim 4, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 23 (Previously Presented): The method of fabricating a semiconductor device according to claim 5, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 24 (Previously Presented): The method of fabricating a semiconductor device according to claim 6, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 25 (Previously Presented): The method of fabricating a semiconductor device according to claim 1, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 26 (Previously Presented): The method of fabricating a semiconductor device according to claim 2, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 27 (Previously Presented): The method of fabricating a semiconductor device according to claim 3, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 28 (Previously Presented): The method of fabricating a semiconductor device according to claim 4, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 29 (Previously Presented): The method of fabricating a semiconductor device according to claim 5, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 30 (Previously Presented): The method of fabricating a semiconductor device according to claim 6, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 31 (Withdrawn): A method of fabricating a semiconductor device comprising the steps of:

forming an amorphous semiconductor film having an upper surface;

forming a first crystalline region by irradiating a first region of the upper surface of the amorphous semiconductor film with a first laser beam by relatively moving the first laser beam in a first direction with respect to the first region of the amorphous semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating a second region of the upper surface of the amorphous semiconductor film including a portion of the first crystalline region with a second laser beam by relatively moving the second laser beam in a direction parallel to the first direction with respect to the second region of the amorphous semiconductor film;

wherein:

a wavelength of the first laser beams falls in a range of 370 nm through 650 nm,

a wavelength of the second laser beams falls in a range of 370 nm through 650 nm,

the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction.

Claim 32 (Withdrawn): A method of fabricating a semiconductor device according to claim 31, wherein:

a first laser beam has a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape

a second laser beam has a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape

Claim 33 (Withdrawn): A method of fabricating a semiconductor device comprising the steps of:

forming an amorphous semiconductor film having an upper surface;

forming a first crystalline region by irradiating a first region of the upper surface of the amorphous semiconductor film with a first laser beam having a shape at an irradiated face or a vicinity thereof in a linear or rectangular shape by relatively moving the first laser beam in a

short direction of the first laser beam with respect to the first region of the upper surface of the amorphous semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating a second region of the upper surface of the amorphous semiconductor film including a portion of the first crystalline region with a second laser beam having a shape at an irradiated face or a vicinity thereof in a linear or rectangular shape by relatively moving the second laser beam in the short direction of the second laser beam parallel to the short direction of the first laser beam with respect to the second region of the upper surface of the amorphous semiconductor film;

wherein:

a wavelength of the first laser beams falls in a range of 370 nm through 650 nm,
a wavelength of the second laser beams falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the short direction of the first and the second laser beams.

Claim 34 (Withdrawn): A method of fabricating a semiconductor device comprising:
a first step of forming an amorphous semiconductor film having an upper surface;
a second step of forming a first crystalline semiconductor film by partially crystallizing the upper surface of the amorphous semiconductor film by a heating treatment; and
a third step of forming a second crystalline semiconductor film by irradiating the crystalline semiconductor film with first and second laser beams;

wherein the third step comprises the steps of:

forming a first crystalline region by irradiating a first region of the first crystalline semiconductor film with the first laser beam by relatively moving the first laser beam in a first direction with respect to the first region of the first crystalline semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating a second region of the first crystalline semiconductor film including a portion of the first crystalline region with the second laser beam by relatively moving the second laser beam in

a direction parallel to the first direction with respect to the second region of the first crystalline semiconductor film; and

wherein:

a wavelength of the first laser beams falls in a range of 370 nm through 650 nm,
a wavelength of the second laser beams falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the first direction.

Claim 35 (Withdrawn): A method of fabricating a semiconductor device according to claim 34, wherein:

a first laser beam has a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape

a second laser beam has a shape at an irradiated face or a vicinity thereof in a linear or a rectangular shape.

Claim 36 (Withdrawn): A method of fabricating a semiconductor device comprising:

a first step of forming an amorphous semiconductor film having an upper surface;

a second step of forming a first crystalline semiconductor film by partially crystallizing the upper surface of the amorphous semiconductor film by a heating treatment; and

a third step of forming a second crystalline semiconductor film by irradiating the first crystalline semiconductor film with first and second laser beams having a liner shape, a rectangular shape or the combination of a liner shape and a rectangular shape at an irradiated face or a vicinity thereof while relatively moving the first and second laser beams in a short direction of the laser beam with respect to the first crystalline semiconductor film;

wherein the third step comprises the steps of:

forming a first crystalline region by irradiating a first region of the first crystalline semiconductor film with the first laser beam by relatively moving the first laser beam in the short direction of the first laser beam with respect to the first region of the first crystalline semiconductor film; and

after forming the first crystalline region, forming a second crystalline region by irradiating a second region of the first crystalline semiconductor film including a portion of the first crystalline region with the second laser beam by relatively moving the second laser beam in the short direction of the second laser beam parallel to the short direction of the first laser beam with respect to the second region of the first crystalline semiconductor film; and

wherein:

a wavelength of the first laser beams falls in a range of 370 nm through 650 nm,
a wavelength of the second laser beams falls in a range of 370 nm through 650 nm,
the first region of the upper surface of the semiconductor film overlaps with only a portion of the second region of the upper surface along the short direction of the first and the second laser beams.

Claim 37 (Withdrawn): The method of fabricating a semiconductor device according to claim 31, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 38 (Withdrawn): The method of fabricating a semiconductor device according to claim 33, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 39 (Withdrawn): The method of fabricating a semiconductor device according to claim 34, wherein a crystalline performance of the first crystalline region, a crystalline performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 40 (Withdrawn): The method of fabricating a semiconductor device according to claim 36, wherein a crystalline performance of the first crystalline region, a crystalline

performance of the second crystalline region and a crystalline performance of a region overlapped with the first crystalline region and the second crystalline region are the same.

Claim 41 (Withdrawn): The method of fabricating a semiconductor device according to claim 31, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 42 (Withdrawn): The method of fabricating a semiconductor device according to claim 33, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 43 (Withdrawn): The method of fabricating a semiconductor device according to claim 34, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 44 (Withdrawn): The method of fabricating a semiconductor device according to claim 36, wherein the semiconductor device is a liquid crystal display apparatus or an EL display apparatus.

Claim 45 (Withdrawn): The method of fabricating a semiconductor device according to claim 31, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 46 (Withdrawn): The method of fabricating a semiconductor device according to claim 33, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 47 (Withdrawn): The method of fabricating a semiconductor device according to claim 34, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 48 (Withdrawn): The method of fabricating a semiconductor device according to claim 36, wherein the semiconductor device is employed on a device selected from the group consisting of: a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book and a portable information terminal.

Claim 49 (Withdrawn): The method of fabricating a semiconductor device according to claim 31, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 50 (Withdrawn): The method of fabricating a semiconductor device according to claim 33, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 51 (Withdrawn): The method of fabricating a semiconductor device according to claim 34, wherein the laser beam is a laser beam selected from the group consisting of: a second harmonic of a YAG laser, a second harmonic of a YVO₄ laser and a second harmonic of a YLF laser.

Claim 52 (Withdrawn): The method of fabricating a semiconductor device according to claim 36, wherein the laser beam is a laser beam selected from the group consisting of: a second

Applicant : Koichiro Tanaka
Serial No. : 09/842,797
Filed : April 27, 2001
Page : 20 of 22

Attorney's Docket No.: 12732-034001 / US4891

harmonic of a YAG laser, a second harmonic of a YVO_4 laser and a second harmonic of a YLF laser.

Applicant : Koichiro Tanaka
Serial No. : 09/842,797
Filed : April 27, 2001
Page : 21 of 22

Attorney's Docket No.: 12732-034001 / US4891

Evidence Appendix

No evidence is being provided.

Applicant : Koichiro Tanaka
Serial No. : 09/842,797
Filed : April 27, 2001
Page : 22 of 22

Attorney's Docket No.: 12732-034001 / US4891

Related Proceedings Appendix

There are no related proceedings.